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Why did the Participation Rate in Job-Related Training Decline during the 1990s in Canada?

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by
André Léonard

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Abstract

This paper examines the evolution of participation rates in training activities in Canada, as measured by the last three cycles (1992, 1994 and 1998) of the Adult Education and Training Survey. The participation rate for job-related and employer-sponsored training fell from 26.7% in 1991 to 26.1% in 1993 and then to 24.8% in 1997. The purpose of this article is to try to distinguish between two possible causes of the drop in participation rates: first, the effect of change in the socio-economic characteristics of the population (for example, age, educational attainment, occupation); second, the effect of change in the behaviour of employers and employees toward training.

To this end, two methods have been used: the first is a shift-share analysis that examines what the overall participation rate would have been if only the distribution of the population by specific characteristics (for example, class of worker) had changed during the decade, the participation rate of each group being held constant. The second method is a multivariate analysis, which assesses the probability of taking training at three points in time (1991, 1993 and 1997). These methods decompose the total change in participation rates into (1) the change in the composition of the population, and (2) the change in the behaviour of the population. This analysis is applied separately for men and women.

For the whole of the period under consideration (1991 to 1997), we find that the change in the composition of the population had a positive effect (stronger for women than for men), which appears to have come from changes in the distribution of the population by occupation and specifically, by educational attainment. Simultaneously, there was also a negative impact from the change in the behaviour of employers and employees (stronger among men than women), which explains why the overall participation rate fell.

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Foreword

The Adult Education and Training Survey (AETS) is Canada's most comprehensive source of data on individual participation in formal adult education and training. In addition to measuring the incidence and intensity of formal adult education and training in Canada, the AETS provides socio-economic and demographic profiles of both participants and non-participants. The survey also provides information on the types, duration and location of training that individuals receive and identifies barriers faced by individuals who wish to take some form of training but cannot. It provides information on sources and types of support for training as well.

The survey sample covers all ten provinces and the sample size is large enough to produce estimates for various sub-populations of interest to policy-makers. The three cycles of the AETS conducted in the 1990s allow policy-makers to monitor changes in the incidence and intensity of adult education and training activities during a period characterised by significant economic changes in Canada.

This research paper is part of a series set up by the Applied Research Branch to expand research done with the AETS. An adaptation of this research paper was published in the *Education Quarterly Review*, September 2001.

1. Introduction

Over the past two decades, the labour market has felt the impact of the rapid introduction of new technologies and marked changes in the organization of work. High technology sectors, and more generally, knowledge-based sectors, have acquired an increasingly important place in the economy. Businesses have adopted more flexible management practices requiring more diversified skills from their employees. For many decision-makers and analysts, this type of context requires Canadian workers to participate more extensively in training activities. However, the Adult Education and Training Survey (AETS) shows that the reverse occurred in Canada during the 1990s. This survey was conducted several times during the 80s and 90s. The survey's last three cycles (1992, 1994 and 1998) are comparable in terms of methodology and the questions asked. The AETS is a supplement to the Statistics Canada Labour Force Survey and questions respondents about training activities in which they participated during the previous year. In this article, we will focus on the change in job-related and employer-sponsored training,[1] first because the majority of job-related training is sponsored in one way or another by the employer, and second because we want to determine the attitude of businesses toward the training of their employees.

It is possible that some groups of workers increased their participation in training, but that this effect was masked by changes in the composition of the employed population that would have given greater weight to groups in which participation is normally low. For example, since older workers participate less frequently in training than younger workers, it may be that the global participation rate decreased because of the increase in the proportion of older workers in the employed population during the 1990s. The same situation may be true of other characteristics. We know that the participation rate of self-employed workers is lower than that of salaried workers. It may be that the increase in the proportion of self-employed workers in the total labour force resulted in a slight drop in the global participation rate.

The purpose of this analysis is to determine if the drop in the rate of participation in training activities is due to the change in the composition of the population (in terms of various

[1] Training was job related if the individual responded that he had taken at least one training activity "for a current or future job," as opposed to "for personal interest"; it was "sponsored by the employer" when the latter offered it, reimbursed for it or facilitated it in some way (training taken by the employee during work hours, reimbursement of travel or accommodation expenses related to training, for example).

socio-economic characteristics) or to a change in the behaviour of workers or businesses. To this end, we will examine changes in the aggregate rates in two ways. The first is a shift-share analysis that takes one characteristic at a time (such as age) and examines what might have happened to the aggregate participation rate if only the distribution of the population by this specific characteristic had changed, the participation rate of each group being held constant. Using this method, it is easy to quickly identify the groups in which the participation rate rose or fell, as well as the most significant changes in the population distribution by several characteristics, and how each of these changes, taken separately, influenced the global participation rate. However, this method does not control for the effect of change in the distribution of the population by all the other characteristics and cannot determine the total impact of the changes in the distribution of the population. The second method used is a multivariate analysis that involves estimating an equation that assesses the probability of taking training based on certain determinants and at different points in time (in 1991, 1993 and 1997). These equations use the same independent variables (e.g. socio-economic characteristics) as the shift-share analysis. Since the evolution in participation rates was different for men and women, we will provide a separate multivariate analysis for the two sexes. We will then combine the coefficients obtained using data from a specific cycle of the survey (for example, 1997) with the independent variables of a previous cycle (for example, 1991). This will allow us to predict the participation rate that would have been observed if all the independent variables had remained unchanged. In this way, we will be able to measure the impact of the change in the independent variables (composition effect) and of the change in the estimated coefficients (behaviour effect) on participation rates.

The next section provides the definitions of the concepts used and an overview of the evolution in participation rates. Section 3 gives the results of the shift-share analysis and Section 4 those of the multivariate analysis. The conclusion summarizes the analysis and suggests areas for future research.

2. Evolution in Training Indicators

A useful way to obtain an overview of the situation is to look at the incidence of training. Incidence is measured by calculating the participation rate of a specific population, that is, the number of participants in training activities divided by the number of individuals in the population considered. In this case, the population considered will be the employed population between the ages of 25 and 54 years. Older workers are about to leave the labour force. Consequently, their behaviour in terms of training is quite different from that of middle-aged workers. Similarly, workers between the ages of 17 and 24 may include students who are completing their initial education on a part-time basis.

Table 1 shows the participation rates in job-related, employer-sponsored training for the employed population aged 25 to 54 for the last three cycles of the AETS, by sex. The participation rate in this type of training dropped during the 1990s, falling from 26.7% in 1991 to 26.1% in 1993 and then to 24.8% in 1997. The participation rates of men and women did not evolve in the same way during the past decade: the rate for women increased very slightly while that of men decreased. Contrary to what was seen in 1991, women had a higher participation rate than men in 1997. In short, the drop in the participation rate of men was sharper than the increase in that of women, with the result that the global participation rate decreased slightly.

Table 1: **Training participation rate of workers between 25 and 54 years, by sex**

Job-related, employer-sponsored training	**1991**	**1993**	**1997**
	%	%	%
Men	27.9	26.3	23.9
Women	25.4	25.9	25.7
Total	26.7	26.1	24.8

Source: Adult Education and Training Survey, Statistics Canada.

The characteristics examined (employment category, occupation, industry, . . .) tell us the individual's status at the time of the survey (e.g. in January 1992 for the cycle covering 1991) and not at the time that the training was taken. It is therefore possible that the individual's situation changed in the meantime.

3. Shift-Share Analysis

Through shift-share analysis it is possible to decompose the change in the aggregate training participation rate into three parts. The first, called the composition effect, shows the part of the total change in a variable due to variation in the weights of the different groups in the population being considered. In this case, the objective is to explain the change in the training participation rate by changes in the weight that certain groups have in the employed population. For example, we can examine participation rates by age group. If the weight of the oldest age groups increased between 1991 and 1997, but each age group displays the same participation rate in 1991 as in 1997, then the aggregate rate will decrease because the aggregate rate is a weighted sum of the rates of each group and the weight of the groups taking less training (the oldest workers) increased.

The second effect is the behaviour effect. This part is due to a change in demand or supply of training for each group, and cannot be attributed to a change in the composition of the employed population.

Lastly, the sum of the behaviour and composition effects will not add up exactly to the total variation in the aggregate rate because there is a residual from the interaction between the changes in behaviour and in composition. This residual is difficult to interpret economically. We will call it the interaction effect. It tends to be negligible compared with the composition and behaviour effects.

Formally, if we examine the change from 1991 to 1997, for example:

(Equation 1) $$\Delta T = \sum_{i=1}^{n} \Delta p_i * t_{i,1991} + \sum_{i=1}^{n} \Delta t_i * p_{i,1991} + \sum_{i=1}^{n} \Delta p_i * \Delta t_i$$

composition behaviour interaction

where ΔT is the aggregate participation rate of 1997 less that of 1991,

$t_{i,1991}$ is the participation rate of group i in 1991,

$p_{i,1991}$ is the weight of group i in 1991,

Δt_i is the change in the participation rate of group i ($t_{i,1997} - t_{i,1991}$),

Δp_i is the change in the weight of group i ($p_{i,1997} - p_{i,1991}$), and

n is the number of groups.

The composition effect (first term on the right-hand side of Equation 1) is a weighted sum of the changes in the weights of the various groups. The weighting factors used are the 1991 participation rates. We are therefore examining what would have happened if the participation rate of each group had remained constant and only the shares of these groups in the employed population changed.

The behaviour effect (second term on the right side of Equation 1) is a weighted sum of the changes in participation rates using as weighting factors the initial shares of each group in the population.

Lastly, the interaction effect (last expression on the right side of Equation 1) is a sum of the product of the changes in the participation rates and the changes in the shares of each group.

Tables A.1 to A.12 of Appendix A present the detailed findings. The shift-share analysis is done separately for each of the following characteristics: sex, age group, educational attainment, province, marital status, type of work (employed full time or part time), industry, occupation, job tenure, union status, class of worker (salaried or self-employed) and firm size. We are interested in these characteristics because changes in the population's distribution occurred based on these characteristics during the last decade and could have masked certain changes in the behaviour of individuals and firms.

3.1 Sex

As is evident from Table A.1, the participation rate in job-related, employer-sponsored training is similar among men and women. However, from 1991 to 1997, it fell among men and increased slightly among women. The proportion of women in the employed population fell very slightly between 1991 and 1997. The demographic changes and the difference in male and female participation rates are too small to have produced a composition effect and affected the aggregate participation rate. The decline in the participation rate (two percentage points) is essentially due, in this case, to the drop in the participation rate of men, which exceeded the slight increase observed among women.

3.2 Age

Table A.2 shows the participation rates by age group: 25-34, 35-44 and 45-54 years. Participation peaks for the 35-44 age group in all three of the survey's cycles. The change over time in training participation rates differs, however, for each group: the 25-34 and 35-44 groups have lower rates in 1997 than in 1991, while the 45-54 group has a higher rate. If we take a moment to examine the evolution in weights of each group, we see that the youngest group saw its weight decrease in the population. The share for the 35-44 and 45-54 groups increased.

In total, the changes in the age structure of employees have only a marginal impact on the drop in the aggregate participation rate in job-related, employer-sponsored training. The drop in the latter rate essentially reflects the decrease in the rates of the 25-34 and 35-44 age groups, which more than offset the increase in the participation rate of the 45-54 age group.

3.3 Educational attainment

Table A.3 presents the results for the employed population by educational attainment. The participation rate climbs with educational attainment in all three cycles. The differences in participation rates are quite marked between the lowest and highest levels of education.

The average educational attainment in the population rose between 1991 and 1997. In effect, the share held by the two most educated groups increased by more than four percentage points each. Since the more educated groups take more training, there is a positive composition effect related to education, of about two percentage points. This means that, if the behaviour of each group had remained the same as in 1991, the aggregate rate of participation in job-related, employer-sponsored training would have been slightly more than two percentage points higher than in 1991; it would have climbed from 26.7% to 28.7% rather than dropped to 24.8%, all things otherwise being equal. Among all of the characteristics considered in this analysis, the educational attainment is the one for which we see the greatest positive composition effect. It is a drop in the participation of each group (especially university graduates) that more than offsets the positive composition effect related to the change in the distribution of the population by educational attainment.

3.4 Province

Table A.4 displays the training participation rates by province.[2] They vary considerably from 16.6% for Quebec to 30.4% for Nova Scotia in 1997. The trend during the 1990s is also quite different from province to province. In Quebec, Alberta, Newfoundland, Manitoba and British Columbia, the participation rate fell, while in Nova Scotia it increased markedly. The other provinces experienced slight increases. As for the distribution of the employed population by province, there was not much change. British Columbia's and Ontario's shares increased, that of Quebec decreased and those of the other provinces remained stable or decreased slightly. As a result, the composition effect attributable to the distribution of the population by province is almost nil. The drop in the aggregate total must rather be attributed to the fact that the decreases in the participation rates in the provinces of Newfoundland, Quebec, Manitoba, Alberta and British Columbia more than offset the increases in participation rates observed in other provinces.

3.5 Marital status

Table A.5 shows the participation rates in training by marital status, that is, whether the respondent was married (or living common law) or single (unmarried, separated, divorced or widowed). The proportion of single persons increased between 1991 and 1997. Married individuals have a slightly higher participation rate than single persons. However, the differences between the two groups and the changes in the distribution of the population based on this characteristic are so small that the composition effect is virtually nil. The dominant effect is a behaviour effect that reflects a decline in the participation rate of both groups.

3.6 Full-time and part-time work

Table A.6 shows the training participation rate based on whether the respondents held full-time or part-time employment at the time of the survey. Full-time employees have a higher participation rate than part-time employees.[3] However, this difference narrowed over time because the participation rate of full-time workers fell and that of part-time workers increased.

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[2] The AETS is done in January. However, in 1998, in the case of Quebec, the survey was conducted in March because of the ice storm. It is possible that this may have had an impact on the data.

[3] Note that we are referring to employer-sponsored training. Part-time employees have a higher participation rate than full-time employees in non employer-sponsored training (not shown in the table).

Part-time workers acquired a larger share of total employment from 1991 to 1997: the composition effect associated with this characteristic is therefore negative, but weak. The behaviour effect is also negative given the drop in the participation rate of full-time employees.

3.7 Industry

We combined the industries into seven major groups (Table A.7).[4] We can see that participation rates varied widely from one industry to another. For example, in 1997, the "primary and construction" sector had a participation rate of 16.7% compared with 44.7% for the public administration sector. Some sectors with above-average participation rates (public administration, finance) saw their weight decrease in the employed population, which contributes negatively to the composition effect. On the other hand, the weight of some sectors with below-average rates (primary, trade) also fell. Overall, changes in the distribution of employment by industry had a marginal negative effect on the participation rate. The drop in the aggregate rate is attributed rather to a behaviour effect reflecting decreases in participation in the manufacturing, services and public administration sectors.

3.8 Occupation

Participation rates vary widely by occupation groups (Table A.8). For example, in 1997, the participation rate was 40.6% for natural and social science employees and 16.5% for the primary, manufacturing and processing group. The weight of several groups in which there is a higher incidence of training, such as employees in management and administration, natural and social sciences and teaching and health, increased slightly from 1991 to 1997. This resulted in a slightly positive composition effect (+0.4 percentage points). However, participation rates fell in most occupational groups, with the strongest decreases in the natural and social sciences, teaching and health and construction, transportation and handling. This negative behaviour effect more than offset the positive effect of the change in the distribution of employment by occupation.

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[4] The AETS classifies industries in 13 groups, but some contain too few observations for the resulting analysis to be reliable. These industries were combined in groups with similar activities and participation rates (e.g. durable and non-durable manufacturing). A similar grouping was done for occupations.

3.9 Job tenure

As Table A.9 shows, job-related, employer-sponsored training increases with job tenure to peak for the group with between 11 and 20 years or with more than 20 years of job tenure, depending on the survey cycle being considered. The change in the distribution of employees by job tenure explains in part the change in the aggregate participation rate, especially for the period from 1993 to 1997. The composition effect associated with this characteristic is –0.4 percentage points for the entire period. This result is caused by the fact that the share of employment held by workers with low training participation rates (workers with 7 to 12 months of job tenure) increased, while the share of employment held by groups with high participation rates (workers with 11 to 20 years of job tenure) declined.

3.10 Union status

Table A.10 gives the participation rates by union status: unionized, not unionized but covered by a collective agreement, and neither unionized nor covered.[5] We see that unionized employees or those covered by a collective agreement have a higher participation rate than non-unionized employees. The proportion of workers unionized or covered by a collective agreement fell, especially between 1993 and 1997. Since they had higher rates than non-unionized employees, the result is a slight negative composition effect between 1991 to 1997, which is added to the negative behaviour effect, given that the participation rate fell among both unionized and non-unionized workers.

3.11 Class of worker

In Table A.11, we look at the participation rates by class of worker.[6] We see that self-employed workers take less employer-sponsored job-related training than salaried workers. Since the share of self-employed workers rose sharply, especially between 1993 and 1997, there is a strong negative composition effect linked to the distribution of workers by class. The change in the

[5] Workers who refused to disclose or were unaware of their union status were excluded, which slightly increases the aggregate participation rates reported in Table A.10 compared with previous tables, given that excluded workers have a lower participation rate than other groups.

[6] The definition of a self-employed worker in 1992 was different from that used in 1994 and 1998, but was still comparable. However, unpaid family workers were excluded because they represent too small a class. This exclusion changes very slightly the various aggregate participation rates in Table A.11 compared with Tables A.1 to A.9.

distribution by class of worker is the change which results in the strongest negative composition effect.

Sponsored training can be difficult to define in the case of self-employed workers. By the definition of a self-employed worker, all training taken must be sponsored by the worker. The AETS data show that approximately 10% of self-employed workers took non employer-sponsored training. There are several ways to explain this result, the most obvious one being the interpretation of the question itself. In effect, if you ask a self-employed worker if his employer sponsored the training, it is possible that he will respond negatively because there is no employer except himself. It is also important to remember that the class of worker is defined at the time of the survey and not at the time that the training was taken. The individual could have had a different status at the time of the training, for example, have been a salaried worker and taken non-sponsored training at that time. Lastly, the self-employed worker might have another salaried, part-time job and have taken non-sponsored training within the context of that work.

3.12 Firm size

Table A.12 reports participation rates among salaried workers by firm size.[7] We see that the incidence of training increases with the number of employees. From 1991 to 1993, small firms appear to have held a greater share of salaried jobs, while the opposite occurred from 1993 to 1997, resulting in a negative composition effect for the 1991-1993 period and a positive one for 1993 to 1997. For the period as a whole, the composition effect is narrowly positive, but is more than offset by the strong negative behaviour effect caused by the drop in participation across virtually all firm sizes, especially large businesses (500 and more employees).

3.13 Summary

The purpose of the shift-share analysis was to identify what changes occurred in the composition of the employed population and the degree to which they may have influenced the participation rate in job-related, employer-sponsored training. The population distribution did not change

[7] We did not include self-employed workers among small firms so that it was possible to isolate the effect of firm size from that of the distribution between salaried and self-employed workers. This again changes the various aggregate participation rates, which increase without the inclusion of self-employed workers compared with the rates reported in Tables A.1 to A.9.

much for most of the characteristics examined, which is not surprising given the short period of time considered (1991-1997). Nevertheless, changes in the proportion of full-time or part-time workers, the industry, job tenure, union status, and especially the class of worker tended to lower the participation rate. On the other side, changes in the composition of the population with respect to occupation, firm size and educational attainment placed upward pressure on the participation rate. The most notable change was in regard to educational attainment, which, by itself, exercised upward pressure of approximately two percentage points on the participation rate between 1991 and 1997. Based on this analysis, the drop in the aggregate participation rate reflects essentially a change in behaviour.

Of course, with this method, when we examine a specific characteristic, we do not keep the other variables constant so that it is difficult to determine the effect of a specific characteristic. Further, it is not possible to add together the composition effects of each characteristic to obtain a total composition effect because some of the characteristics are correlated. For these reasons, the next section presents a multivariate analysis that can isolate the effect of each variable on the probability of taking training. It is then possible to determine which part of the change in the aggregate participation rate is due to a change in the characteristics of the population.

4. Multivariate Analysis

Our multivariate analysis involves estimating the probability of taking training at various points in time according to observable characteristics of the employee (such as age, job tenure, sex and educational attainment), and those of the firm where the employee worked (such as size and industry). In this way, we obtain estimated coefficients for each variable at various points in time. We then decompose the difference in the global rates into two parts: the difference observed in the distribution of the population of each sample (e.g. 1991 and 1997) by certain characteristics, which is referred to as the "composition effect," and the difference observed between the effect of each variable in each sample (e.g. a smaller effect of firm size in 1997 than in 1991), which is referred to as the "behaviour effect."

For each year, we estimate two equations, one for men and one for women. It is possible that the determining factors for participation in training are different for men and women. Simply including a dichotomous variable for gender in one equation covering both sexes might not have been appropriate because, for each independent variable, the behaviour of men might have been different from that of women. For example, being a part-time worker might reduce the probability of taking training more for women than for men. Our approach resulted in the identification of different composition and behaviour effects for men and women.

A similar analysis was used by Oaxaca (1973) to explain the role of discrimination in the wage gap between men and women. Oaxaca estimated a separate wage equation for each sex. According to his analysis, part of the difference found in average salaries comes from differences between male and female in the independent variables (hours worked, industry, occupation, etc.) and part from the different coefficients for each independent variable. It is the latter part that represents the discrimination effect.

In our case, we are not comparing two groups but two (or three) different years. In addition, because our dependent variable, participation in training, is a dichotomous variable (takes training, does not take training), our estimates will be done by logistic regression (logit). Logit is similar to probit (only the distribution of the error term is different); both methods are valid but logit enables us to easily obtain odds-ratio that are simple to interpret. The principle of logit is to assess the probability that a dependent variable (Y) takes the value of 0 or 1 given the values of

the independent variables. The variable Y is equal to 1 when the individual took training and to 0 in the opposite instance. Logit assesses the probability that the dichotomous variable Y takes the value of 1 at time i (1991, 1993 or 1997) as follows:

(Equation 2) $$\text{Prob}(Y=1) = \frac{e^{B_i X_i}}{1+e^{B_i X_i}}$$

The X_i and B_i represent respectively the matrix of independent variables and the estimated coefficients at time i. In this way, we attribute to each individual a probability of taking training based on the individual's socio-economic characteristics. For each characteristic, we created one or more dichotomous variables based on the number of groups (e.g. three for the age groups, 25 to 34, 35 to 44 and 45 to 54). These variables were equal to 1 when the individual was part of a given group and to 0 otherwise. When estimating the equation, it is always necessary to exclude a group for each characteristic. The excluded group becomes the reference group, that is, the one that serves as the comparison point with the other groups. In this case, the largest group in the population (the largest number of observations) was selected as the reference group for each of the characteristics.

The characteristics included in the equations are those used for the shift-share analysis so that it will be possible to compare the results from both approaches.

4.1 Results of the estimations for men

Table B.1 of Appendix B shows the detailed results of the regressions carried out using the 1991, 1993 and 1997 data for men. For each year, and for each variable, the table shows the average, the estimated coefficient and its standard deviation (shown in parentheses), and the odds-ratio. The average gives us the share of each group in the population examined (employed male population aged 25 to 54 years). A positive coefficient means that being part of the group to which this coefficient is attached increases the probability of taking training compared to the appropriate reference group (e.g. for age, the 25-34 group). A negative sign means the opposite. The size of the coefficient is important from a relative standpoint, that is, in relation to the other coefficients. Lastly, the odds-ratio indicates the expected probability of taking training for individuals in the group being considered compared with the reference group. For example, in

1991, whereas residing in Quebec diminished the probability of taking training by 15% (0.85-1.00 –-0.15) compared with residents of Ontario, residing in Alberta increased this probability by 67% (1.67-1.00– +0.67). We use a likelihood ratio that follows a chi-square distribution to judge whether the coefficient is significant or not. When it is, it means that belonging to this group significantly changes the probability of taking training compared with the reference group.

Examining the age group variables, we see that there was no significant difference in the probability of taking training between the 25-34 group and the 35-44 group, at least in the last two cycles of the survey. However, the oldest group (45 to 54) was less likely to take training than the others. This result is often attributed to the fact that older workers have fewer years to benefit from the positive results of training. However, this effect appears to have decreased over time. Thus, in relation to the 25-34 group, being between 45 and 54 years reduced the probability of taking training by 42% in 1991 and by about 27% in the last two cycles (1993 and 1997).

For all three cycles of the AETS, we see that the probability of taking training increased with educational attainment. Workers who had not finished high school were at a clear disadvantage compared with those who had earned a postsecondary degree. Educational attainment may reflect the interest or capabilities of workers as far as training is concerned. Firms probably take this indicator into consideration when selecting employees who are most likely to benefit from training. It should be pointed out that the average educational attainment in the population rose between 1991 and 1997. Among men, the share held by the two most educated groups increased by more than three percentage points.

In 1997, single men (unmarried, separated, divorced or widowed) displayed a probability of taking training that was about 34% lower than for married men or men living common law. One interpretation of this finding could be that single persons have different unobserved characteristics (tastes, aptitudes, etc.).

Residents of Quebec were less likely to take training than those of Ontario and this effect increased over the years. In comparison, residents of the western provinces (Manitoba, Saskatchewan, Alberta and British Columbia) were more likely to take training, especially in 1991 and 1993.

Self-employed workers displayed a lower participation rate in training activities than salaried workers. However, by keeping the effect of the other variables constant, the difference between self-employed and salaried workers was not significant in 1997, although it was in 1991 and 1993. It is possible that the increased proportion of self-employed workers in the employed population during these years resulted in these workers improving their access to training services (by the creation of associations of self-employed workers) or that training suppliers adapted their services to these workers' needs. Part-time workers were less likely to receive training than full-time workers, but the gap appears to have narrowed from 1993 to 1997.

The probability of taking training also increased with firm size in all three cycles. For example, in 1997, workers in firms with fewer than 20 employees had a 63% lower probability of taking training than their colleagues working in firms of 500 and more employees, everything else being equal. One of the main arguments put forward to explain this is that large firms can provide more training because they benefit from economies of scale.

When the data are analysed by industry, we find that public administration employees and those in the finance and transport sectors had a higher probability of taking training than employees in the services sector. In terms of occupation, workers in management and administration, natural and social sciences, and in teaching and health were more likely than those in sales, arts and services to take training. It is normal for workers in certain sectors or occupations to require more training than others; it depends on the scope of technological change in a specific industry or occupation, the speed with which knowledge is changing or mandatory requirements.

As we saw, unionized workers have a higher participation rate than non-unionized workers. However, when we take into consideration the characteristics of the two groups (education, occupation, industry . . .), we find that being unionized has a negative effect on the probability of taking training, especially in 1993 and 1997. The group of employees covered by a collective agreement without being unionized is so small that it is difficult to say if it has a greater chance of training than non-unionized workers.

Lastly, for the three cycles of the survey, we were able to observe that the probability of taking training increased with job tenure, a result that suggests that employers prefer to train employees who are less likely to leave their current job and go to work elsewhere.

4.2 Gap between men and women with respect to participation in training activities

For several of the characteristics studied, the distribution of women in the employed population is different from that of men (Table B.2). There are fewer women than men in the self-employed workers group and more in the part-time workers group. They also have shorter job tenure than men. In 1991, women showed a lower average level of education than men, although in 1997, the two averages were similar. Distribution by industry and occupation remain very different: there are more women than men in the services and finance sectors, but fewer in the primary and construction industries, manufacturing and transport. They are also proportionally more numerous than men in occupations related to teaching and health or office work. Lastly, proportionally more women than men are not married. The distribution of women and men is similar by age, province, firm size and union status.

As for age group, we saw earlier that the probability of taking training remained lower among men in the 45 to 54 age group than in the 25 to 34 age group for the three years of the study. However, in 1997, women between 45 and 54 years had a 15% higher probability of taking training than women between 25 and 34 years.

The data from the survey's last cycle show that educational attainment seems to be a more determining characteristic for women than for men. The odds-ratio of participating in training for university graduates compared with people not having finished high school was 4 for women, compared with 2.7 for men.[8]

In terms of marital status, not being married strongly reduced the probability of taking training among men only (-34% in 1997). This effect was not significant among women for the same year. Self-employed female workers showed a similar probability of participation to salaried female workers for the three years of the study, while self-employed male workers were less likely than salaried male workers to take training in 1991 and 1993.

Working in the finance and public administration sectors increased the probability of taking training more for men than for women. However, the probability of participation of men working in the trade sector was similar to that of men working in the services sector (reference group).

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[8] These results are obtained by dividing the odds-ratio of the group that has a university degree by that of the group that does not have a high school diploma: for men: 1.02 0.38 = 2.7; for women: 1.32 0.33 = 4.0.

while among women, employees in the trade sector recorded a probability of training 25% to 40% lower than those in the services sector. In terms of occupation, the differences between the most favoured and least favoured groups, with respect to the probability of taking training, was more pronounced among women than men. For example, in 1997, women in the natural and social sciences group had a probability of participation in training activities 5.7 times higher than employees in construction, transportation and handling, while the ratio for men was 2.4. Lastly, we must point out one large difference between men and women. Among men, the proportion of workers with an occupation in one of the three groups with the highest probability of participation (natural and social sciences, teaching and health, management and administration) changed little between 1991 and 1997. In the case of women, this proportion increased by more than five percentage points (from 37.6% in 1991 to 42.8% in 1997).

Unionized women were as likely to take training as non-unionized women, while unionized men were less likely to do so than non-unionized men.

Lastly, job tenure proved to be a more important factor among men than among women; for the latter, the gap between the groups with only a short tenure and those with a long tenure was smaller. For example, in 1997, the probability of taking training was 37% higher among men with 20 and more years of job tenure than among those with 1 to 5 years of service. For women, the probability also appeared to increase with job tenure, but the difference was not significant.

4.3 Expected values of participation rates

Table 2 shows the expected participation rates for men and women, which were calculated by combining the independent variables and estimated coefficients for the various years. The figures in bold represent the actual participation rates, which can be obtained by taking the average of the probabilities of each worker for a given year, since error terms are on average nil. For example, row X_{1991} B_{1991} shows the actual participation rates observed in 1991. The other rows give the figures obtained by combining the estimated coefficients and independent variables of the various years. Thus, row X_{1991} B_{1993} shows the average of the probabilities calculated with the values of the independent variables for 1991, but using the coefficients obtained in the equation estimated with 1993 data.

Table 2 **Expected values of participation rates, by sex**

Independent variables	Coefficients	Men	Women
X_{1991}	**B_{1991}**	**27.9**	**25.4**
	B_{1993}	26.6	24.5
	B_{1997}	24.2	23.5
X_{1993}	B_{1991}	27.4	26.4
	B_{1993}	**26.3**	**25.9**
	B_{1997}	23.7	25.0
X_{1997}	B_{1991}	28.0	27.4
	B_{1993}	27.2	27.0
	B_{1997}	**23.9**	**25.7**

It is quite simple to decompose the changes into the composition effect and the behaviour effect. For the composition effect, we look at what would have happened to the participation rate if all the independent variables had changed, but the estimated coefficients had been kept constant. For the behaviour effect, we vary the coefficients associated with each variable and leave the independent variables unchanged. For example, we observed a participation rate for men of 27.9% in 1991 and 26.3% in 1993. To measure the composition effect between these two years, we determine the participation rate obtained by combining the 1991 estimated coefficients (B_{1991}) and the 1993 independent variables (X_{1993}). The resultant expected participation rate is 27.4% and the composition effect is –0.5 (27.4 - 27.9). To determine the behaviour effect, we keep the independent variables at their 1991 values (X_{1991}) and use the coefficients estimated with the 1993 data (B_{1993}). This gives us an expected participation rate of 26.6% and a behaviour effect of –1.3. The residual, that is, the share of the change in the global rate that is not attributable to the composition and behaviour effects is, in this case, +0.2.[9]

Compared with the shift-share analysis, the regression–based decomposition analysis enables us to obtain a "global" composition effect that takes into account the changes in all of the observed characteristics of the population. Table 3 summarizes the different effects for both sexes for the periods 1991 to 1993 and 1993 to 1997.

For the period from 1991 to 1993, the changes in the composition of the employed population resulted in a slight downward pressure (-0.5) on the global participation rate of men and an

[9] We could have reversed the process and begun with the 1993 rate and gone back to 1991. Both calculations are valid and give similar results. This dilemma is tantamount to choosing, in a more traditional Oaxaca decomposition, which is the basic salary structure (the men's or the women's) to determine which part of the differences in salary is due to discrimination.

upward pressure (+1.0) on that of women. The difference between the two sexes may come from population distributions by educational attainment and occupation, which changed more among women than among men. The drop in the global rate from 1991 to 1993 among men is entirely due to a negative behaviour effect, that is, a change in the impact of the various variables examined on the probability of participation in training activities. For women, the negative behaviour effect was also negative, but not as strong as for men. The positive composition effect offset the negative behaviour effect, consequently, the participation of women increased slightly.

For the period from 1993 to 1997, the composition effect was positive and of a similar magnitude for both men and women. The behaviour effect, however, was negative and stronger for men than for women. This explains why the participation rate dropped for men and remained almost unchanged for women.

Table 3 **Composition and behaviour effects, by sex**

	Men	Women
Total — 1991 to 1993	-1.6	+0.5
Composition	-0.5	+1.0
Behaviour	-1.3	-0.9
Residual	+0.2	+0.4
Total — 1993 to 1997	-2.4	-0.2
Composition	+0.9	+1.1
Behaviour	-2.6	-0.9
Residual	-0.7	-0.4

Throughout the period examined (1991 to 1997), we see a marked difference between the behaviour of men and women. For men, in spite of a change in the composition of the population that should have slightly increased participation, participation actually fell because of a change in the impact of the independent variables on the probability of participating in training. This suggests a change in behaviour among workers (or their employers). For women, the composition effect was stronger than the behaviour effect. This is why their participation rate increased slightly.

5. Conclusion

The purpose of this work was to determine whether certain changes in the composition of the population, in terms of socio-economic characteristics such as age, occupation, class of worker, etc., could have masked positive changes in training participation rates among different groups of workers during the 1990s. In effect, the participation rates of several groups rose in spite of the drop in the global participation rate. In particular, the participation rates of women, workers aged 45 to 54, residents of some provinces, part-time employees, workers with more than 20 years of job tenure, and self-employed workers increased.

In the first part of our work, we identified how the distribution of the population had changed over the past decade and the extent to which these changes had affected training participation rates during the 1990s. This gave us a list of socio-economic factors that we suspected had exercised upward or downward pressure on these participation rates. The second part of our work attempted, with the help of multivariate analysis, to divide the total change in the aggregate training participation rate between a change in the impact of all of the independent variables (behaviour effect) and a change in these independent variables themselves (composition effect).

By bringing together the findings of these two approaches, it is possible to develop a profile of the change in training participation rates. From 1991 to 1993, the change in independent variables was too small to significantly affect participation rates. Another way of describing things would be to say that changes in the distribution of the employed population based on certain characteristics (educational attainment, occupation) had a positive effect on the aggregate rate while other characteristics (class of worker, firm size) had the opposite effect, the two effects cancelling each other out. It should be noted that, overall, the composition effect was slightly negative for men, but positive for women. The decline in the participation rate from 1991 to 1993 is largely attributable to a negative behaviour effect. For the period from 1993 to 1997, the composition effect was positive overall. The behaviour effect was negative and larger (in absolute value) than the composition effect. For the whole of the period examined (1991 to 1997), there was a positive composition effect, higher for women than for men, and a negative behaviour effect, higher for men than for women. Overall, the participation rate of men fell and that of women rose.

It would be interesting to understand what factors caused this negative behaviour effect in a context that, according to many observers, calls for greater participation in training. One possibility is that informal training is gaining ground among the means of acquiring skills in the labour force. The AETS ignores this type of training. Changes in the economic situation are another possible explanation for the negative behaviour effect. In times of growth, the opportunity cost of training may be higher than in times of recession for employees and firms. Another possibility is that the relative cost of training increased during the past decade.[10] It is also possible that the training that is offered does not adequately meet the new training needs of employees and firms.

Lastly, it would be useful to carry out a similar analysis examining the length of training taken and not just the incidence. As Jennings (1996) mentioned, there may be an inverse relation between length and incidence. For example, activities taken by individuals who do not take training often are longer (number of hours per activity). The data from the last three cycles of the survey show a very significant increase in the number of hours of training taken per participant. If it is true that incidence is inversely proportional to duration, then the positive composition effect associated with incidence should have translated into a drop in the average hours of training. However, the opposite occurred. In fact, the number of hours per participant increased so much that, in spite of the decline in the proportion of workers participating in training, the number of training hours per worker still increased. This observation tends to suggest that the training problem in the employed population, if any, has less to do with the quantity of training taken than with the distribution of that training among the various groups of the population.

[10] An indicator of the increase in the relative cost of training is that the "education-training" component of the consumer price index (CPI) increased much faster between 1991 and 1997 than the overall CPI. Based on these data, the relative cost of education and training would have increase about 50% during this period, primarily because of an increase in tuition fees (author's estimate).

Appendix A

Participation rates in job–related employer–sponsored training, proportion of each group in the 25–54 years old employed population and decomposition of the changes, based on the 1992, 1994 and 1998 AETS, by specific characteristics

Table A.1 **Shift–Share Analysis, by Sex**

	Men	Women	Total			
1991						
Proportion	53.8	46.2	100.0			
Participation rate	27.9	25.4	26.7			
1993						
Proportion	54.1	45.9	100.0			
Participation rate	26.3	25.9	26.1			
1997						
Proportion	54.0	46.0	100.0			
Participation rate	23.9	25.7	24.8			
Change 1991-1993				**Compos.**	**Behav.**	**Inter.**
Proportion	0.3	-0.3				
Participation rate	-1.6	0.6	-0.6	0.0	-0.6	0.0
Change 1993-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-0.1	0.1				
Participation rate	-2.3	-0.3	-1.4	0.0	-1.4	0.0
Change 1991-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	0.2	-0.2				
Participation rate	-4.0	0.3	-2.0	0.0	-2.0	0.0

Table A.2 **Shift–Share Analysis, by Age Group**

	25-34 years	35-44 years	45-54 years	Total			
1991							
Proportion	37.8	37.2	25.1	100.0			
Participation rate	27.7	29.3	21.5	26.7			
1993							
Proportion	36.1	37.7	26.2	100.0			
Participation rate	25.1	27.9	24.9	26.1			
1997							
Proportion	33.1	38.1	28.7	100.0			
Participation rate	23.8	25.3	25.2	24.8			
Change 1991-1993					**Compos.**	**Behav.**	**Inter.**
Proportion	-1.7	0.5	1.2				
Participation rate	-2.6	-1.4	3.4	-0.6	-0.1	-0.7	0.1
Change 1993-1997					**Compos.**	**Behav.**	**Inter.**
Proportion	-3.0	0.4	2.5				
Participation rate	-1.3	-2.6	0.3	-1.4	0.0	-1.4	0.0
Change 1991-1997					**Compos.**	**Behav.**	**Inter.**
Proportion	-4.7	0.9	3.7				
Participation rate	-3.9	-4.0	3.7	-2.0	-0.1	-2.0	0.1

Table A.3 **Shift–Share Analysis, by Educational Attainment**

	High school not completed	High school diploma	Partial postsecondary	Postsecondary diploma	University degree	Total			
1991									
Proportion	19.2	24.2	8.6	29.4	18.7	100.0			
Participation rate	9.8	22.8	30.6	30.8	41.4	26.7			
1993									
Proportion	16.4	22.4	8.2	31.7	21.3	100.0			
Participation rate	10.8	20.7	28.5	30.1	36.6	26.1			
1997									
Proportion	13.0	20.3	8.0	35.7	23.0	100.0			
Participation rate	8.9	18.3	26.6	27.2	34.9	24.8			
Change 1991-1993							**Compos.**	**Behav.**	**Inter.**
Proportion	-2.8	-1.8	-0.4	2.4	2.7	-0.6	1.0	-1.5	-0.1
Participation rate	1.1	-2.0	-2.1	-0.7	-4.7				
Change 1993-1997							**Compos.**	**Behav.**	**Inter.**
Proportion	-3.4	-2.1	-0.2	4.0	1.7	-1.4	1.0	-2.3	0.0
Participation rate	-2.0	-2.4	-1.9	-2.9	-1.7				
Change 1991-1997							**Compos.**	**Behav.**	**Inter.**
Proportion	-6.2	-3.9	-0.6	6.3	4.3	-2.0	2.0	-3.8	-0.1
Participation rate	-0.9	-4.4	-4.0	-3.6	-6.4				

Table A.4 **Shift–Share Analysis, by Province**

	Newfound-land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total			
1991														
Proportion	1.5	0.4	3.0	2.3	24.8	38.7	3.8	3.5	10.0	12.1	100.0			
Participation rate	25.9	22.9	24.0	22.5	22.8	26.3	30.9	27.7	34.4	29.9	26.7			
1993														
Proportion	1.5	0.4	2.9	2.2	23.9	39.1	3.9	3.3	10.1	12.8	100.0			
Participation rate	22.5	31.3	27.1	22.5	20.5	27.0	29.4	28.2	30.6	29.6	26.1			
1997														
Proportion	1.4	0.4	2.8	2.1	23.8	39.4	3.7	3.1	10.4	12.9	100.0			
Participation rate	20.7	25.1	30.4	22.9	16.6	27.7	26.7	30.1	27.8	26.2	24.8			
Change 1991-1993												**Compos.**	**Behav.**	**Inter.**
Proportion	-0.1	0.0	0.0	-0.1	-0.9	0.4	0.1	-0.2	0.1	0.7				
Participation rate	-3.4	8.4	3.1	0.0	-2.3	0.7	-1.5	0.5	-3.8	-0.3	-0.6	0.1	-0.7	0.0
Change 1993-1997												**Compos.**	**Behav.**	**Inter.**
Proportion	-0.1	0.0	-0.1	-0.1	-0.1	0.3	-0.2	-0.2	0.3	0.1				
Participation rate	-1.8	-6.2	3.3	0.4	-4.0	0.7	-2.8	1.9	-2.8	-3.4	-1.4	0.0	-1.4	0.0
Change 1991-1997												**Compos.**	**Behav.**	**Inter.**
Proportion	-0.2	0.0	-0.2	-0.2	-1.0	0.8	-0.1	-0.4	0.4	0.8				
Participation rate	-5.2	2.2	6.4	0.4	-6.3	1.4	-4.3	2.4	-6.6	-3.7	-2.0	0.1	-2.1	0.0

Table A.5 **Shift–Share Analysis, by Marital Status**

	Married or common law	Unmarried/widowed/ separated/divorced	Total			
1991						
Proportion	77.4	22.6	100.0			
Participation rate	27.5	24.1	26.7			
1993						
Proportion	76.6	23.4	100.0			
Participation rate	26.6	24.5	26.1			
1997						
Proportion	74.7	25.3	100.0			
Participation rate	25.6	22.2	24.8			
Change 1991-1993				**Compos.**	**Behav.**	**Inter.**
Proportion	-0.8	0.8				
Participation rate	-0.9	0.4	-0.6	0.0	-0.6	0.0
Change 1993-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-1.9	1.9				
Participation rate	-1.0	-2.3	-1.4	0.0	-1.3	0.0
Change 1991-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-2.7	2.7				
Participation rate	-1.9	-1.9	-2.0	-0.1	-1.9	0.0

Table A.6 **Shift–Share Analysis, by Type of Work**

	Full-time employees	Part-time employees	Total			
1991						
Proportion	87.6	12.5	100.0			
Participation rate	28.5	13.9	26.7			
1993						
Proportion	88.2	11.8	100.0			
Participation rate	27.8	14.0	26.1			
1997						
Proportion	85.8	14.2	100.0			
Participation rate	26.1	16.5	24.8			
Change 1991-1993				**Compos.**	**Behav.**	**Inter.**
Proportion	0.6	-0.6				
Participation rate	-0.8	0.0	-0.6	0.1	-0.7	0.0
Change 1993-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-2.3	2.3				
Participation rate	-1.6	2.6	-1.4	-0.3	-1.1	0.1
Change 1991-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-1.7	1.7				
Participation rate	-2.4	2.6	-2.0	-0.2	-1.8	0.1

Table A.7 **Shift–Share Analysis, by Industry**

	Primary and construction	Manufacturing	Transport	Trade	Finance	Services	Public Administration	Total			
1991											
Proportion	9.8	15.9	8.6	15.4	7.2	34.9	8.2	100.0			
Participation rate	16.3	23.9	32.4	17.2	35.9	27.0	47.3	26.7			
1993											
Proportion	9.4	15.2	8.7	15.0	7.0	37.4	7.4	100.0			
Participation rate	16.0	24.6	29.1	17.4	37.7	25.4	48.7	26.1			
1997											
Proportion	8.7	16.9	8.5	14.7	6.0	38.2	7.1	100.0			
Participation rate	16.7	20.3	32.0	17.6	36.5	24.2	44.7	24.8			
Change 1991-1993									**Compos.**	**Behav.**	**Inter.**
Proportion	-0.4	-0.8	0.1	-0.4	-0.1	2.4	-0.8				
Participation rate	-0.3	0.7	-3.3	0.2	1.8	-1.6	1.4	-0.6	-0.1	-0.5	0.0
Change 1993-1997									**Compos.**	**Behav.**	**Inter.**
Proportion	-0.7	1.8	-0.2	-0.3	-1.1	0.8	-0.3				
Participation rate	0.7	-4.3	2.9	0.2	-1.2	-1.2	-4.0	-1.4	-0.1	-1.1	0.0
Change 1991-1997									**Compos.**	**Behav.**	**Inter.**
Proportion	-1.2	1.0	-0.1	-0.7	-1.2	3.3	-1.2				
Participation rate	0.4	-3.6	-0.4	0.4	0.6	-2.8	-2.6	-2.0	-0.2	-1.6	-0.1

Table A.8 **Shift–Share Analysis, by Occupation**

	Management and administration	Natural and social sciences	Teaching and health	Sales, arts and services	Office	Primary, manufacturing and processing	Construction, transportation and handling	Total			
1991											
Proportion	16.0	6.8	12.0	21.5	16.4	12.1	15.3	100.0			
Participation rate	39.3	48.5	38.1	17.6	23.5	16.3	19.5	26.7			
1993											
Proportion	16.1	7.4	12.4	21.7	15.9	11.9	14.6	100.0			
Participation rate	41.4	46.1	32.7	16.3	22.8	16.1	20.0	26.1			
1997											
Proportion	16.4	8.7	12.3	21.3	13.8	16.6	10.9	100.0			
Participation rate	37.8	40.6	31.9	16.3	22.5	16.5	16.3	24.8			
Change 1991-1993									**Compos.**	**Behav.**	**Inter.**
Proportion	0.1	0.5	0.4	0.3	-0.5	-0.3	-0.7				
Participation rate	2.1	-2.4	-5.4	-1.3	-0.8	-0.1	0.5	-0.6	0.2	-0.8	0.0
Change 1993-1997									**Compos.**	**Behav.**	**Inter.**
Proportion	0.2	1.4	-0.1	-0.4	-2.1	4.7	-3.7				
Participation rate	-3.6	-5.6	-0.9	0.0	-0.3	0.4	-3.7	-1.4	0.2	-1.6	0.2
Change 1991-1997									**Compos.**	**Behav.**	**Inter.**
Proportion	0.4	1.9	0.3	-0.2	-2.6	4.4	-4.4				
Participation rate	-1.5	-8.0	-6.3	-1.3	-1.0	0.3	-3.2	-2.0	0.4	-2.4	0.1

Table A.9 **Shift–Share Analysis, by Job Tenure**

	1 to 6 months	7 to 12 months	1 to 5 years	6 to 10 years	11 to 20 years	More than 20 years	Total			
1991										
Proportion	10.8	5.2	31.8	18.9	24.3	9.1	100.0			
Participation rate	14.1	21.1	26.1	28.7	32.2	28.7	26.7			
1993										
Proportion	10.2	5.4	29.3	21.5	23.3	10.4	100.0			
Participation rate	13.4	11.7	23.8	30.4	31.4	31.7	26.1			
1997										
Proportion	9.6	6.8	33.9	20.6	17.3	11.7	100.0			
Participation rate	12.3	17.2	23.8	29.0	27.7	30.2	24.8			
Change 1991-1993								**Compos.**	**Behav.**	**Inter.**
Proportion	-0.6	0.2	-2.5	2.6	-1.0	1.3	-0.6	0.1	-0.9	0.2
Participation rate	-0.7	-9.4	-2.3	1.7	-0.8	3.0				
Change 1993-1997								**Compos.**	**Behav.**	**Inter.**
Proportion	-0.6	1.4	4.6	-0.9	-6.0	1.3	-1.4	-0.5	-1.1	0.3
Participation rate	-1.1	5.5	0.0	-1.4	-3.7	-1.5				
Change 1991-1997								**Compos.**	**Behav.**	**Inter.**
Proportion	-1.2	1.6	2.1	1.7	-7.0	2.6	-2.0	-0.4	-2.0	0.5
Participation rate	-1.8	-3.9	-2.3	0.3	-4.5	1.5				

Table A.10 **Shift–Share Analysis, by Union Status**

	Unionized	Non-unionized, covered by collective agreement	Not unionized nor covered by a collective agreement	Total			
1991							
Proportion	35.7	4.5	59.9	100.0			
Participation rate	34.5	32.5	24.4	28.4			
1993							
Proportion	35.2	4.4	60.4	100.0			
Participation rate	31.6	30.3	24.6	27.3			
1997							
Proportion	30.8	2.8	66.4	100.0			
Participation rate	29.1	36.5	22.2	24.7			
Change 1991-1993					**Compos**	**Behav.**	**Inter.**
Proportion	-0.5	0.0	0.5				
Participation rate	-2.9	-2.2	0.2	-1.1	-0.1	-1.0	0.0
Change 1993-1997					**Compos**	**Behav.**	**Inter.**
Proportion	-4.4	-1.6	6.0				
Participation rate	-2.5	6.2	-2.4	-2.6	-0.4	-2.1	-0.1
Change 1991-1997					**Compos**	**Behav.**	**Inter.**
Proportion	-4.9	-1.7	6.5				
Participation rate	-5.4	4.0	-2.2	-3.7	-0.5	-3.1	-0.2

Note Respondents who refused to disclose or did not know their union status are excluded

Table A.11 **Shift–Share Analysis, by Class of Worker**

	Salaried workers	Self-employed workers	Total			
1991						
Proportion	90.8	9.2	100.0			
Participation rate	28.4	11.6	26.8			
1993						
Proportion	89.9	10.2	100.0			
Participation rate	27.9	11.3	26.2			
1997						
Proportion	83.4	16.6	100.0			
Participation rate	27.0	14.0	24.8			
Change 1991-1993				**Compos.**	**Behav.**	**Inter.**
Proportion	-1.0	1.0				
Participation rate	-0.5	-0.3	-0.6	-0.2	-0.5	0.0
Change 1993-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-6.4	6.5				
Participation rate	-0.9	2.7	-1.3	-1.1	-0.5	0.3
Change 1991-1997				**Compos.**	**Behav.**	**Inter.**
Proportion	-7.4	7.4				
Participation rate	-1.4	2.4	-1.9	-1.2	-1.0	0.3

Note: Unpaid family workers are excluded.

Table A.12 **Shift–Share Analysis, by Firm Size**

	Fewer than 20 employees	20-99 employees	100-499 employees	500 and + employees	Total			
1991								
Proportion	22.6	14.8	15.1	47.5	100.0			
Participation rate	14.6	21.7	31.9	40.2	30.4			
1993								
Proportion	24.2	15.3	15.4	45.0	100.0			
Participation rate	14.7	22.0	29.3	40.6	29.7			
1997								
Proportion	19.9	16.6	16.8	46.8	100.0			
Participation rate	12.4	21.9	30.7	34.2	27.2			
Change 1991-1993						**Compos.**	**Behav.**	**Inter.**
Proportion	1.6	0.5	0.3	-2.5				
Participation rate	0.1	0.3	-2.6	0.3	-0.7	-0.5	-0.2	0.0
Change 1993-1997						**Compos.**	**Behav.**	**Inter.**
Proportion	-4.4	1.3	1.4	1.8				
Participation rate	-2.3	-0.1	1.4	-6.3	-2.5	0.7	-3.2	0.0
Change 1991-1997						**Compos.**	**Behav.**	**Inter.**
Proportion	-2.8	1.8	1.7	-0.7				
Participation rate	-2.2	0.2	-1.2	-6.0	-3.2	0.2	-3.4	0.0

Appendix B

Results of Regression

Table B.1 **Results of the Logit Regressions, for Participation in Job-Related, Employer-Sponsored Training, Men, 25-54 years old**

Variable	1991			1993			1997		
	Average %	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*
Constant	100.0	***-0.51 (0.11)	------	100.0	***-0.27 (0.12)	------	100.0	***-0.70 (0.14)	------
Age group									
25 to 34 years	37.3	------	1.00	35.9	------	1.00	33.0	------	1.00
35 to 44 years	37.1	**-0.15 (0.06)	0.86	37.3	-0.09 (0.07)	0.91	38.1	-0.11 (0.08)	0.89
45 to 54 years	25.6	***-0.55 (0.08)	0.58	26.8	***-0.33 (0.08)	0.72	28.9	***-0.32 (0.09)	0.73
Educational attainment									
High school not completed	21.1	***-0.89 (0.08)	0.41	18.4	***-0.86 (0.09)	0.42	14.8	***-0.98 (0.12)	0.38
High school diploma	21.2	***-0.32 (0.07)	0.73	21.1	***-0.55 (0.08)	0.58	20.0	***-0.53 (0.09)	0.59
Partial postsecondary	8.5	0.10 (0.09)	1.11	7.1	***-0.28 (0.11)	0.75	7.8	0.03 (0.11)	1.03
Postsecondary diploma	29.6	------	1.00	32.1	------	1.00	34.0	------	1.00
University degree	19.6	***0.23 (0.07)	1.26	21.3	0.00 (0.08)	1.00	23.4	0.02 (0.08)	1.02
Marital status									
Married or common law	79.9	------	1.00	78.0	------	1.00	75.5	------	1.00
Single	20.1	***-0.43 (0.07)	0.65	22.0	***-0.28 (0.07)	0.76	24.5	***-0.42 (0.08)	0.66
Province of residence									
Newfoundland	1.6	0.01 (0.20)	1.01	1.5	-0.03 (0.23)	0.97	1.3	*-0.48 (0.28)	0.62
Prince Edward Island	0.4	0.17 (0.42)	1.19	0.4	-0.01 (0.43)	0.99	0.4	-0.02 (0.53)	0.98
Nova Scotia	3.0	-0.08 (0.15)	0.93	2.9	*0.26 (0.15)	1.30	2.8	0.24 (0.17)	1.27
New Brunswick	2.3	0.03 (0.17)	1.03	2.2	0.07 (0.18)	1.07	2.1	-0.19 (0.21)	0.83
Quebec	24.9	**-0.16 (0.06)	0.85	24.6	***-0.30 (0.07)	0.74	24.0	***-0.69 (0.08)	0.50
Ontario	39.4	------	1.00	39.3	------	1.00	40.1	------	1.00
Manitoba	3.7	** 0.30 (0.13)	1.36	3.8	**0.33 (0.14)	1.39	3.8	0.01 (0.15)	1.01
Saskatchewan	3.4	***0.39 (0.14)	1.47	3.3	**0.35 (0.15)	1.43	3.1	0.25 (0.16)	1.28
Alberta	10.0	***0.51 (0.08)	1.67	10.2	*0.18 (0.09)	1.19	10.5	0.09 (0.10)	1.10
British Columbia	12.3	***0.38 (0.08)	1.47	12.8	**0.21 (0.08)	1.23	12.9	-0.04 (0.09)	0.96
Class of worker									
Self-employed	11.2	***-0.38 (0.11)	0.69	12.0	***-0.41 (0.12)	0.67	20.5	-0.05 (0.11)	0.95
Salaried	88.8	------	1.00	88.0	------	1.00	79.5	------	1.00
Type of work									
Part-time	3.6	***-0.55 (0.19)	0.58	3.4	***-0.78 (0.21)	0.46	5.1	**-0.35 (0.17)	0.70
Full time	96.4	------	1.00	96.6	------	1.00	94.9	------	1.00

TableB.1(Continued)

Variable	1991			1993			1997		
	Average %	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*
Firm size									
Fewer than 20 employees	26 4	***-0 98 (0 08)	0 38	30 3	***-1 38 (0 09)	0 25	32 2	***-1 01 (0 11)	0 37
20 to 99 employees	12 7	***-0 65 (0 08)	0 52	13 4	***-0 90 (0 09)	0 41	15 0	***-0 59 (0 10)	0 56
100 to 499 employees	11 9	**-0 16 (0 07)	0 85	12 2	***-0 69 (0 08)	0 50	13 6	-0 06 (0 09)	0 94
500 and more employees	*38 4*	------	*1 00*	*35 2*	------	*1 00*	*37 7*	------	*1 00*
Does not know/refuses to answer	10 6	***-0 87 (0 12)	0 42	8 9	***-1 70 (0 14)	0 18	1 5	***-1 01 (0 31)	0 36
Industry									
Primary industry and construction	14 5	0 10 (0 11)	1 10	14 5	-0 03 (0 12)	0 97	13 1	***0 30 (0 13)	1 36
Manufacturing industry	21 2	0 13 (0 09)	1 14	20 8	0 13 (0 10)	1 14	22 8	0 04 (0 11)	1 04
Transport	11 5	***0 48 (0 10)	1 62	11 9	**0 24 (0 11)	1 28	10 9	***0 63 (0 12)	1 87
Trade	16 1	0 13 (0 09)	1 13	16 3	0 02 (0 10)	1 02	15 5	0 10 (0 11)	1 10
Finance	5 1	***0 47 (0 12)	1 60	4 7	***0 80 (0 13)	2 23	4 3	***0 71 (0 15)	2 04
Services	*23 1*	------	*1 00*	*24 4*	------	*1 00*	*25 9*	------	*1 00*
Public administration	8 5	***0 76 (0 10)	2 13	7 4	***0 81 (0 11)	2 25	7 5	***1 09 (0 12)	2 98
Occupation									
Management and administration	17 3	***0 41 (0 08)	1 51	17 1	***0 60 (0 09)	1 82	16 1	***0 52 (0 11)	1 67
Natural and social sciences	8 3	***0 76 (0 10)	2 14	9 0	***0 87 (0 11)	2 39	10 7	***0 81 (0 12)	2 25
Teaching and health	6 6	***0 55 (0 12)	1 74	5 8	***0 52 (0 13)	1 68	6 0	***0 69 (0 15)	1 98
Sales, arts, services	*19 4*	------	*1 00*	*20 4*	------	*1 00*	*19 2*	------	*1 00*
Office work	5 1	-0 16 (0 12)	0 85	5 3	-0 08 (0 13)	0 92	5 4	0 03 (0 15)	1 03
Primary industry and processing	17 2	-0 10 (0 10)	0 90	17 4	0 09 (0 11)	1 10	24 5	0 15 (0 11)	1 17
Construction, transportation and handling	26 1	*-0 15 (0 09)	0 86	25 0	**0 23 (0 10)	1 26	18 1	-0 07 (0 12)	0 93
Union status									
Unionized	33 6	**-0 15 (0 07)	0 86	31 7	***-0 42 (0 07)	0 66	30 3	***-0 27 (0 08)	0 77
Covered by collective agreement	3 5	-0 11 (0 13)	0 89	3 9	-0 17 (0 13)	0 85	2 8	*0 28 (0 17)	1 32
Does not know/refuses to answer	8 7	***-0 86 (0 13)	0 42	7 5	***-0 68 (0 14)	0 51	0 5	0 50 (0 45)	1 65
Non-unionized	*54 2*	------	*1 00*	*56 9*	------	*1 00*	*66 4*	------	*1 00*

Table B.1(Continued)

Variable	1991			1993			1997		
	Average %	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*
Job tenure									
1 to 6 months	8.7	***-0.52	0.59	8.9	***-0.38	0.68	8.6	***-0.89	0.41
		(0.11)			(0.12)			(0.14)	
7 to 12 months	5.0	***-0.46	0.63	5.3	***-0.65	0.52	7.0	***-0.34	0.71
		(0.13)			(0.16)			(0.14)	
1 to 5 years	*28.8*	------	*1.00*	*26.9*	------	*1.00*	*33.4*	------	*1.00*
6 to 10 years	18.5	0.04	1.04	20.5	**0.17	1.19	18.8	0.11	1.12
		(0.07)			(0.08)			(0.09)	
11 to 20 years	27.3	***0.30	1.35	24.5	*0.14	1.16	18.4	**0.19	1.21
More than 20 years	11.7	***0.32	1.37	13.9	***0.44	1.55	13.8	***0.31	1.37
		(0.10)			(0.10)			(0.11)	

Note: Standard deviations are shown in parentheses.
Variables in italics represent the reference groups.
Figures with asterisks are significant to: * 90%, ** 95%, *** 99%

Table B.2 Results of the Logit Regressions, for Participation in Job-Related, Employer-Sponsored Training, Women, 25-54 years old

Variable	1991			1993			1997		
	Average %	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*
Constant	100.0	***-0.73 (0.12)	------	100.0	***-0.92 (0.12)	------	100.0	***-1.01 (0.12)	------
Age group									
25 to 34 years	*38.2*	------	*1.00*	*36.4*	------	*1.00*	*33.2*	------	*1.00*
35 to 44 years	37.3	-0.05 (0.06)	0.95	38.1	**0.14 (0.07)	1.15	38.2	0.09 (0.07)	1.10
45 to 54 years	24.5	***-0.35 (0.08)	0.71	25.5	0.03 (0.08)	1.03	28.6	*0.14 (0.08)	1.15
Educational attainment									
High school not completed	17.0	***-1.01 (0.12)	0.36	14.1	***-0.87 (0.12)	0.42	10.9	***-1.11 (0.15)	0.33
High school diploma	27.6	*-0.14 (0.07)	0.87	23.8	***-0.27 (0.08)	0.76	20.6	***-0.38 (0.09)	0.68
Partial postsecondary	8.8	0.13 (0.10)	1.14	9.5	0.13 (0.10)	1.14	8.3	-0.11 (0.11)	0.90
Postsecondary diploma	*28.9*	------	*1.00*	*31.2*	------	*1.00*	*37.6*	------	*1.00*
University degree	17.7	0.12 (0.08)	1.13	21.4	-0.02 (0.07)	0.98	22.6	***0.28 (0.07)	1.32
Marital status									
Married or common law	*74.5*	------	*1.00*	*75.0*	------	*1.00*	*73.8*	------	*1.00*
Single	25.5	***-0.17 (0.06)	0.84	25.0	*-0.11 (0.06)	0.90	26.2	0.08 (0.06)	1.09
Province of residence									
Newfoundland	1.4	0.07 (0.24)	1.07	1.4	-0.38 (0.25)	0.68	1.4	-0.10 (0.27)	0.90
Prince Edward Island	0.4	0.12 (0.45)	1.13	0.4	** 0.83 (0.40)	2.30	0.4	0.24 (0.44)	1.28
Nova Scotia	2.9	-0.01 (0.17)	0.99	2.9	0.01 (0.17)	1.01	2.9	0.21 (0.17)	1.24
New Brunswick	2.3	*-0.33 (0.20)	0.72	2.2	*-0.41 (0.21)	0.66	2.1	-0.12 (0.21)	0.89
Quebec	24.7	**-0.18 (0.07)	0.83	23.1	***-0.53 (0.08)	0.59	23.7	***-0.68 (0.08)	0.51
Ontario	*39.1*	------	*1.00*	*40.2*	------	*1.00*	*39.6*	------	*1.00*
Manitoba	3.9	***0.41 (0.14)	1.51	4.0	*0.26 (0.14)	1.29	3.6	0.13 (0.16)	1.14
Saskatchewan	3.5	** 0.31 (0.15)	1.36	3.3	0.21 (0.15)	1.24	3.2	0.27 (0.16)	1.31
Alberta	10.0	***0.72 (0.09)	2.06	9.8	***0.38 (0.09)	1.47	10.2	* 0.17 (0.10)	1.19
British Columbia	11.8	***0.33 (0.09)	1.39	12.7	***0.23 (0.09)	1.26	12.9	0.12 (0.09)	1.13
Class of workers									
Self-employed	8.0	-0.16 (0.15)	0.86	8.7	-0.09 (0.14)	0.92	12.6	-0.13 (0.12)	0.88
Salaried	*92.0*	------	*1.00*	*91.3*	------	*1.00*	*87.4*	------	*1.00*
Type of work									
Part-time	22.8	***-0.59 (0.08)	0.55	21.8	***-0.57 (0.08)	0.57	24.8	***-0.27 (0.08)	0.76
Full-time	*77.2*	------	*1.00*	*78.2*	------	*1.00*	*75.2*	------	*1.00*
Firm size									
Fewer than 20 employees	24.4	***-1.03 (0.09)	0.36	25.4	***-0.83 (0.09)	0.44	29.3	*** 0.89 (0.10)	0.41
20 to 99 employees	11.3	***-0.76 (0.10)	0.47	11.3	***-0.58 (0.10)	0.56	13.5	-0.11 (0.09)	0.90
100 to 499 employees	12.5	***-0.38 (0.08)	0.68	12.8	-0.11 (0.08)	0.90	14.5	0.08 (0.08)	1.08
500 or more employees	*39.1*	------	*1.00*	*39.1*	------	*1.00*	*40.1*	------	*1.00*
Does not know/refuses to answer	12.7	***-1.12 (0.11)	0.33	11.4	***-1.03 (0.11)	0.36	2.6	***-0.72 (0.23)	0.49

Table B.2(Continued)

Variable	1991			1993			1997		
	Average %	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*	*Average %*	*Coefficient*	*Odds-ratio*
Industry									
Primary industry and construction	4.3	-0.09 (0.18)	0.91	3.3	-0.10 (0.20)	0.91	3.5	0.14 (0.21)	1.15
Manufacturing industry	9.7	0.02 (0.12)	1.02	8.5	0.06 (0.13)	1.07	10.0	0.14 (0.13)	1.16
Transport	5.2	* 0.21 (0.13)	1.23	4.9	0.06 (0.13)	1.05	5.7	***0.67 (0.13)	1.96
Trade	14.5	***-0.57 (0.11)	0.57	13.5	***-0.37 (0.10)	0.69	13.8	**-0.27 (0.11)	0.76
Finance	9.6	***0.38 (0.10)	1.46	9.8	0.15 (0.10)	1.16	8.0	***0.39 (0.11)	1.48
Services	*48.8*	------	*1.00*	*52.6*	------	*1.00*	*52.5*	------	*1.00*
Public administration	7.9	***0.56 (0.10)	1.76	7.4	***0.52 (0.11)	1.68	6.5	***0.43 (0.12)	1.54
Occupation									
Management and administration	14.4	***0.86 (0.10)	2.37	14.9	***1.04 (0.10)	2.82	16.6	0.73 (0.10)	2.08
Natural and social sciences	5.1	***0.98 (0.13)	2.66	5.4	***1.25 (0.13)	3.49	6.5	***0.87 (0.13)	2.40
Teaching and health	18.1	***0.76 (0.11)	2.14	20.2	***0.70 (0.10)	2.02	19.7	***0.36 (0.11)	1.44
Sales, arts, services	*23.9*	------	*1.00*	*23.3*	------	*1.00*	*23.7*	------	*1.00*
Office work	29.5	0.12 (0.09)	1.13	28.4	* 0.17 (0.09)	1.18	23.6	0.00 (0.10)	1.00
Primary industry and processing	6.3	***-0.51 (0.19)	0.60	5.4	**-0.53 (0.21)	0.59	7.3	***-0.69 (0.19)	0.50
Construction, transport-ation and handling	2.7	-0.35 (0.24)	0.70	2.4	-0.27 (0.25)	0.76	2.6	***-0.87 (0.27)	0.42
Union status									
Unionized	30.9	0.08 (0.08)	1.09	32.8	-0.10 (0.08)	0.90	31.1	-0.03 (0.08)	0.97
Covered by collective agreement	4.7	**0.27 (0.12)	1.32	4.2	-0.16 (0.14)	0.85	2.8	**0.38 (0.16)	1.47
Does not know/refuses to answer	9.9	***-0.74 (0.14)	0.48	9.8	***-0.45 (0.12)	0.64	0.5	0.21 (0.41)	1.24
Non-unionized	*54.5*	------	*1.00*	*53.2*	------	*1.00*	*65.6*	------	*1.00*
Job tenure									
1 to 6 months	13.2	***-0.46 (0.10)	0.63	11.7	***-0.67 (0.12)	0.51	10.8	***-0.61 (0.12)	0.55
7 to 12 months	5.4	-0.05 (0.13)	0.95	5.5	***-0.80 (0.16)	0.45	6.6	**-0.34 (0.14)	0.71
1 to 5 years	*35.3*	------	*1.00*	*32.0*	------	*1.00*	*34.6*	------	*1.00*
6 to 10 years	19.4	0.06 (0.07)	1.06	22.8	***0.28 (0.07)	1.33	22.7	***0.22 (0.08)	1.24
11 to 20 years	20.7	0.02 (0.07)	1.02	21.9	***0.37 (0.08)	1.44	16.1	0.03 (0.09)	1.04
More than 20 years	6.0	-0.01 (0.12)	0.99	6.1	0.04 (0.12)	1.04	9.2	0.07 (0.12)	1.07

Note Standard deviations are shown in parentheses
Variables in italics represent the reference groups.
Figures with asterisks are significant to: * 90%, ** 95%, *** 99%.

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